

## AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

### LISTING OF CLAIMS

Claims 1 – 6 (cancelled)

7. (Currently Amended) A bearing apparatus for a wheel of a vehicle comprising:

an inner member including a wheel hub having an integrally formed wheel mounting flange at one end and a cylindrical portion axially extending from the wheel mounting flange;

~~fitting~~ an inner ring ~~onto~~ on the cylindrical portion, the inner ring including an end surface substantially perpendicular to an axis of the bearing apparatus and an outer circumferential surface;

~~arranging~~ an outer member positioned around the inner member;

~~containing~~ double row rolling elements freely ~~rollably~~ rollable between the inner and outer members;

~~securing the inner ring in an axial direction relative to the wheel hub;~~

~~outwardly deforming~~ a caulked portion at the end of the cylindrical portion of the wheel hub ~~to abut~~ abuts against the end surface of the inner ring securing the inner ring in an axial direction relative to the wheel hub; and

~~cutting~~ a chamfered surface positioned between the end surface and the outer circumferential surface of a back side of the inner ring;

~~recutting~~ the chamfered surface recut after heat treatment so that forming an inclined chamfered surface on an obtuse angle between the end surface and the outer circumferential surface, the chamfered surface reduces stress concentrations due to an elimination of gouges on the chamfered surface and prevents the generation of cracks ~~from~~ that would form at the starting point of the ~~geuge~~ gouges.

8. (Previously Presented) The bearing apparatus for a wheel of a vehicle according to claim 7 wherein the wheel hub is formed with an inner raceway surface on its outer circumferential surface and a wheel hub outer circumferential region from a base of the wheel mounting flange to the cylindrical portion through the inner raceway surface is hardened by high frequency induction hardening to have a surface hardness of 54~64 HRC, said caulked portion remains as a non-quenched portion having a surface hardness less than 24 HRC after forging, and hoop stress generated within the inner ring by plastic deformation of the end of the cylindrical portion is limited to less than 300 MPa.

9. (Withdrawn) A method for manufacturing a bearing apparatus for a wheel of a vehicle comprising:

providing an inner member including a wheel hub having an integrally formed wheel mounting flange at one end and a cylindrical portion axially extending from the wheel mounting flange, an inner ring fitted on the cylindrical portion; an outer member arranged around the inner member, and double row rolling elements freely rollably contained between the inner and outer members;

securing the inner ring in an axial direction relative to the wheel hub;  
radially outwardly deforming the end of the cylindrical portion of the wheel hub forming a caulked portion;  
recutting a chamfered outer circumferential surface of a back side of the inner ring after heat treatment of said inner ring.

10. (Withdrawn) The method for manufacturing a bearing apparatus for a wheel of a vehicle according to claim 9 wherein said recutting of the chamfered outer circumferential surface of the back side of the inner ring is re-cut by a hardened steel cutting tool after said heat treatment.

11. (Withdrawn) The method for manufacturing a bearing apparatus for a wheel of a vehicle according to claim 9 wherein said recutting of the chamfered outer circumferential surface of the back side of the inner ring is re-cut by a grinding stone and at least simultaneously cutting an outer circumferential surface of a larger diameter end of the inner ring.

12. (Withdrawn) The method for manufacturing a bearing apparatus for a wheel of a vehicle according to claim 11 wherein said recutting of the chamfered outer circumferential surface of the back side of the inner ring is re-cut by a grinding stone and at least simultaneously cutting a back side end face of a front side of the inner ring and an inner raceway surface of the inner ring.

13. (Currently Amended) A bearing apparatus for a wheel of a vehicle comprising:

an inner member including a wheel hub having an integrally formed wheel mounting flange at one end and a cylindrical portion axially extending from the wheel mounting flange;

~~fitting~~ an inner ring ~~onto~~ on the cylindrical portion, the inner ring including an end surface substantially perpendicular to an axis of the bearing apparatus and an outer circumferential surface;

~~arranging~~ an outer member positioned around the inner member;

~~containing~~ double row rolling elements freely rollably contained between the inner and outer members;

~~securing the inner ring being secured in an axial direction relative to the wheel hub;~~

~~outwardly deforming~~ a caulked portion at the end of the cylindrical portion of the wheel hub to abut against the end surface of the inner ring securing the inner ring in an axial direction relative to the wheel hub; and

~~cutting~~ a chamfered surface positioned between the end surface and the outer circumferential surface of a back side of the inner ring;

~~recutting~~ the chamfered surface is recut after heat treatment of the inner ring forming an inclined chamfered surface on an obtuse angle between the end surface and the outer circumferential surface, ~~such that~~ the chamfered surface reduces stress concentrations due to an elimination of gouges on the chamfered surface and prevents the generation of cracks ~~from~~ that would form at the starting point of the gouge gouges

during previous working steps to uniformly distribute the stress concentration that would be caused by a hoop stress in the inner ring during the caulking operation.